

REMARKS

This Amendment, submitted in response to the Office Action dated December 12, 2007, is believed to be fully responsive to each point of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

I. Summary of Non-Final Office Action

Claims 1-16 are pending.

Claims 11 and 14-16 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement.

The Examiner has withdrawn previous rejections, but rejects the claims under new references.

Claim 11 is rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Igarashi et al. (USP 5,539,466; hereinafter “Igarashi”).

Claims 1-3, 6-8 and 12-16 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Igarashi, in view of Maturi et al. (USP 5,731,850A; hereinafter “Maturi”), in view of Acampora et al. (USP 5,168,356A; hereinafter “Acampora”), and in view of Ng et al. (USP 5,185,819A; hereinafter “Ng”).

Claims 4, 5, 9, and 10 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Igarashi, Maturi, Acampora, and Ng as applied to claims 1 and 6 above, and further in view of Legall (USP 5,878,166A).

II. Analysis of Rejection under 35 U.S.C. § 112

In rejecting claims 11 and 14-16, the Examiner alleges that, while these claims specifically exclude determining a motion compensation (MC) mode from an interpolative frame sum of absolute difference (SAD), an interpolative top field SAD and an interpolative bottom field SAD, paragraph 22 of the specification reads otherwise. Applicant respectfully disagrees.

Paragraph 22 of the specification describes a related art as shown in Fig. 1 in which the MC mode determination unit 150 compares nine (9) SADs calculated. On the contrary, the

claimed methods clearly define that three SADs among the nine SADs are not used in determining an MC mode. The claimed methods are not based on the related art method, and the claim recitation complies with the written description requirement.

Accordingly, Applicant respectfully requests withdrawal of the rejection.

III. Analysis of Claim Rejections under 35 U.S.C. § 102

In rejecting claim 11, the Examiner alleges that the Filed Motion Detector 21, the Frame Motion Detector 22 and the Mode Judgment Circuit 23 in Fig. 1 correspond to or teach the three claimed units, which are the forward sum of absolute difference (SAD) calculation unit, the backward SAD calculation unit and the motion compensation (MC) mode determination unit. Applicant respectfully traverses.

The present application is characterized in that a final MC mode is determined without performing interpolative (bidirectional) MC thereby reducing considerable amount of computation time for encoding pictures. See paragraphs 5, 42 and 61 of the present application.

In addressing this characteristic, claim 11 recites that, in determining an MC mode, any of an interpolative frame SAD, an interpolative top field SAD, and an interpolative bottom field SAD is not used contrary to the conventional motion compensation. Further, claim 11 recites that the MC mode is determined based on six (6) SADs, i.e., a forward frame SAD, a forward top field SAD, and a forward bottom field SAD, a backward frame SAD, a backward top field SAD, and a backward bottom field SAD.

That being considered, Igarashi does not necessarily disclose, in the beginning, that all of the six specifically claimed SADs are calculated by the coding apparatus as shown in Fig. 1. As the Examiner indicates, Igarashi discloses that the Mode Judgment Circuit 23 receives FMAD (frame SAD) and FDAD (field SAD). However, this disclosure is not sufficient for Igarashi to anticipate the claimed apparatus by teaching each and every element of the claim. With respect to the SAD, Igarashi does not disclose more than that some frame SAD and field SAD are used by the Mode Judgment Circuit 23.

Meanwhile, the Examiner enumerates eight motion vectors (MVs) (i.e., FMVoBo, FMVeBo, FMVoBe, FMVeBe, BMVoBo, BMVeBo, BMVoBe and BMVeBe) used in motion estimation of “B” pictures. If these MVs are introduced in the office action only to allege that they correspond or are related to the six specific SADs of the claim, the Examiner’s allegation is not reasonable again. As evident from Fig. 1 of Igarashi, those MVs are not used to determine an MC mode at the Mode Judgment Circuit 23, but used at the MV Selector 24 and the Block Data Generation Mode Judgment Circuit 25 for a different purpose. It is also well known in the art that the SADs are not MVs, and that generating those eight different direction-based MVs does not necessarily lead to generating the same number of the same direction-based SADs since their uses in encoding operation are different from each other.

Moreover, Igarashi does not teach the claimed *no use of any of interpolative SADs*. Instead, it is strongly suggested in col. 19 of Igarashi that interpolative MCs are performed to determine a final MC mode. This is because the reference discloses that all forward, backward and bidirectional MVs are calculated, and further these MVs are calculated for the frame or fields, which would only burden an encoder at the expense of finding the most efficient MC mode. These calculations of all eight different directional and frame-based/field-based MVs may only correspond to the calculations of six MVs (MV_forw_frame, MV_forw_tf, MV_forw_bf, MV_back_frame, MV_back_tf and MV_back_bf) performed in the related art encoder as shown in Fig. 1 of the present application.

At least due to the foregoing reasons, Applicant respectfully submits that Igarashi would not have anticipated the claimed apparatus.

IV. Analysis of Claim Rejections under 35 U.S.C. § 103

In the office action, the Examiner admits that Maturi does not resolve the deficiency of only selecting an MC mode if a minimum SAD value is below a threshold, and encoding in an interpolative field or frame MC mode if the minimum SAD value is above a threshold. Instead, the Examiner alleges that Acampora and Ng make up for this deficiency. Applicant respectfully disagrees.

In operation (c) of the claim, one of the six SADs having a minimum value is selected as an MC mode if the minimum value is less than a threshold. By contrast, Acampora provides that an MV (not an SAD) is selected based on distortion signals in view of a threshold, while an SAD is selected in the claimed method. Interpreting Acampora, an MC mode is selected by comparing MVs, i.e., the final MC of a frame is performed using a selected MV. There is no selection of an MC mode, while the claimed method is directed to selecting an MC mode. This selected MC mode would decide an MV among all possible direction-frame/filed-based MVs, according to paragraph 44 of the specification. Further, assuming, arguendo, that Acampora and Ng, respectively, teach selecting a frame-based MV and a field-based MV, these references do not teach or suggest whether one of a frame-based MV and a field-based MV is selected if the minimum value is not smaller than the threshold. Again, it is known in the art that calculation of an MV is not necessarily corresponding to calculation of an SAD. Methods of calculating an MV and uses of an MV are not the same as those of an SAD.

Moreover, even though the selection of an MV corresponds to that of an SAD, in order for Acampora and Ng to teach operations (c) and (d) of the claim, the references should have disclosed at least an element that receives six different MVs corresponding to the six different SADs recited in operation (a) of the claim. This deficiency subsequently renders Acampora and Ng incapable of disclosing an operation of identifying a minimum value (i.e., a minimum MV among the six different MVs). Thus, as opposed to the Examiner's allegation, Acampora and Ng do not disclose operations (c) and (d) of the claimed method.

Lastly, it is very doubtful to produce the claimed method by combining Acampora/Ng, Igarashi and Maturi. For example, when a most efficient MV has already been selected based on an MC mode determined by the Mode Judgment Circuit 23 in Igarashi, how would the selected MV pair with the MV selection process of Acampora/Ng, which is another MV selection process? Selecting a final MV should then be a very complicated operation, and no one of ordinary skill in the art would have been motivated to combine those cross-purpose teachings. It has been well settled that there would not have been obviousness when "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in

[the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate". See *In re Ratti*, 270 F.2d at 810, 123 USPQ 349. That being considered, the suggested combination of Igarashi, Maturi and Acampora/Ng must require very substantial reconstruction of the circuit in Fig. 3 of Igarashi, and would change the basic principle of the Igarashi. Thus, the obviousness rejection does not comport with the law.

At least due to the foregoing reasons, Applicant respectfully submits that the claimed method would not have been obvious over the references. For the same or similar reasons, claims 6, 12 and 13 should be allowable.

Claims 2-5, 7-11 and 14-16 should be allowable at least due to their dependencies and additionally recited elements.

V. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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CUSTOMER NUMBER

Date: March 12, 2008